

IN THE CLAIMS

Please amend the claims as follows:

1 1 (Currently Amended). A photonic bandgap microcavity comprising:
2 a deformable membrane structure that can experience strain using a plurality of
3 thin-film actuators of at least 0.2% on the deformable membrane, said deformable
4 membrane having semiconductor materials that do not exhibit piezoelectric effects; and
5 a photonic bandgap waveguide element formed on said deformable membrane
6 structure having a defect region that breaks the periodicity of a plurality of periodic holes
7 so that when said deformable membrane structure is strained, said photonic bandgap
8 waveguide element is tuned to a selective amount due to the strain experienced in the
9 defect region of said photonic bandgap waveguide element and said microcavity is not
10 permanently disfigured.

1 2 (Previously Presented). The photonic bandgap microcavity of claim 1, wherein said
2 deformable membrane structure comprises a sub-micron SiO₂ layer.

1 3 (Original). The photonic bandgap microcavity of claim 1, wherein said photonic
2 bandgap waveguide element comprises a 1-dimensional photonic crystal.

1 4. Cancelled.

1 5. Cancelled.

1 6 (Original). The photonic bandgap microcavity of claim 1, wherein said selective
2 amount comprises approximately 1%.

1 7. Cancelled.

1 8 (Previously Presented). The photonic bandgap microcavity of claim 7, wherein said at
2 least one actuator produces strain on said deformable e membrane between 0.2 and 0.3%.

1 9 (Original). The photonic bandgap microcavity of claim 7, wherein said at least one
2 actuator comprises a top electrode.

1 10 (Original). The photonic bandgap microcavity of claim 9, wherein said at least one
2 actuator comprises a bottom electrode.

1 11 (Original). The photonic bandgap microcavity of claim 7, wherein said at least one
2 actuator comprises a PZT piezoelectric actuator.

1 12 (Currently Amended). A method of forming a photonic bandgap microcavity
2 comprising:

3 ~~providing-forming~~ a deformable membrane structure that can experience strain
4 using a plurality of thin-film actuators of at least 0.2% on the deformable membrane, said
5 deformable membrane having semiconductor materials that do not exhibit piezoelectric
6 effects; and

7 forming a photonic bandgap waveguide element on said deformable membrane
8 structure having a defect region that breaks the periodicity of a plurality of periodic holes
9 so that when said deformable membrane structure is strained, said photonic bandgap
10 waveguide element is tuned to a selective amount due to the strain experienced in the
11 defect region of said photonic bandgap waveguide element and said microcavity is not
12 permanently disfigured.

1 13 (Previously Presented). The method of claim 12, wherein said deformable membrane
2 structure comprises a sub-micron SiO₂ layer.

1 14 (Original). The method of claim 12, wherein said photonic bandgap waveguide
2 element comprises a 1-dimensional photonic crystal.

1 15. Cancelled.

1 16. Cancelled.

1 17 (Original). The method of claim 12, wherein said selective amount comprises
2 approximately 1%.

1 18. Cancelled.

1 19 (Previously Presented). The method of claim 18, wherein said at least one actuator
2 produces strain on said deformable membrane between 0.2 and 0.3%.

1 20 (Previously Presented). The method of claim 18, wherein said at least one actuator
2 comprises a top electrode.

1 21 (Previously Presented). The method of claim 20, wherein said at least one actuator
2 comprises a bottom electrode.

1 22 (Previously Presented). The method of claim 18, wherein said at least one actuator
2 comprises a PZT piezoelectric actuator.